

Bradley

UNIVERSITY OF MINNESOTA
THE MEDICAL SCHOOL
MINNEAPOLIS 14

DEPARTMENT OF BACTERIOLOGY
AND IMMUNOLOGY

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Dear Josh and Esther:

Welcome back to the U.S.A. Perhaps you too have grass to cut by now. Even a few leaves on the trees to shade the house. It won't be long until you will be off to the land of the kangaroo. We have survived the Minnesota winter well in spite of chicken pox (December), measles (February) and mumps (April). The latter was most persistent although not severe.

We understand that you, Josh, have been elected to the National Academy of Science. My most sincere congratulations. No finer gentleman nor talented scientist could be chosen.

I went to the S.A.B. Fortunately I stayed only $2\frac{1}{2}$ days, which I find to be my limit of endurance. The papers lacked content but I was able to talk at length with Szybalski and Clark and Webb. The claims for recombination in *Nocardia* (Clark & Webb) are based upon the "cross" white rough x red smooth

↓
up to 7% white smooth

The trouble is they admit that the red smooth produces dark red smooth, yellow smooth and white smooth variants spontaneously. They did not talk much about rates of reversion but it is in the %s. In other words, there is probably no evidence for recombination in this system. Webb is in Argonne at Lemont Illinois now.

Szybalaki is now reporting on S. fradiae. He has found the variation in old heterokaryons which I told you about earlier - i.e. that aged heterokaryons produce non-parental dissociates. Naturally he calls these recombinants. It might be added that some of his non-prototrophic recombinants occur in the crosses at a lower frequency than the reversions in the controls. He does have one good bit of evidence for recombination which I have not obtained. In both S. coelicolor & S. fradiae Szybalaki has SR markers which he says yield different results according to the polarity of the cross. Hence:

ASR X BSS
↓
all SS

ASS X BSR
↓
all SR

This is contradictory to my results wherein the prototrophic progeny ~~are~~ are always SS. The dissociates show the SM coming out with the appropriate parental markers. I have another SR which is interesting in that the SR marker is not recovered in the appropriate parental type. I tentatively think of it as a cytoplasmic SR. Needless to say other possibilities exist & I have much to do with it before I can decide.

We are looking for other markers in S. coelicolor. We tried for carbohydrate utilization again & failed. So I have been forced to resistance markers. At present I have penicillin, sulfa, tetracycline, CdCl₂ and propionic acid.

I don't like them but I am afraid to use U.V. on these stocks any more. I have nightmares about inversions, translocation, etc.

Another development is that not all strains of S. coelicolor can heterokaryotize other strains.

so 114 + 124 \rightarrow +++

136 + 124 \rightarrow +++

128 + 124 \rightarrow +++

136 + 128 \rightarrow +++

114 + 128 \rightarrow -

114 + 136 \rightarrow -

114 & 124 of common origin

128 > each of different origin
136

Looks a little like the F system. 114 dissociates of 114X124 are still infertile with 128 and 136.

We have trifled with the phages (streptomycin phages) with out vast interest. They have the advantage that it doesn't take all day to do an experiment.

at the S.A.B. class interested to note that Ruth Gordon of Rutgers has admitted that there is no difference between Streptomyces and Nocardiopsis. Looks like it should title the next paper: Genetic studies on Nocardiopsis & N. coelicolor. Alas Waksman may lose a genus.

You will have to forgive me for this long letter. I trust that I have not over extended my reception. I wonder if you perchanced to see Hopwood in England. He writes that he is constructing linkage maps, which I think he should. But it is apparent to me that with the selected conditions operating even in supplemented media, a linkage map will be valid only to order - if that.

We were shocked that McCarthy's "serious but uncomplicated hepatitis" was so rapidly fatal. We cannot help but express sorrow to his wife and (adopted) child.

We hope to hear of you soon and trust that we will be able to get together soon. I need to get away from the pressure occasionally. I have not yet decided to sell my soul to culture genetics.

Our very best wishes to you & yours

Gaylen.